A SYSTEM OF ANATOMICAL PLATES OF THE HUMAN BODY:

ACCOMPANIED WITH DESCRIPTIONS,

AND

PHYSIOLOGICAL, PATHOLOGICAL & SURGICAL OBSERVATIONS,

BY

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DEDICATED BY PERMISSION, TO

THE KING.

Desig^d & Eng^d by W. H. Lizars.

EDINBURGH;

PUBLISHED BY W. H. LIZARS 3 S^T JAMES' SQUARE, DANIEL LIZARS 5 S^T DAVID STREET;

S. HIGHLEY 174 FLEET STREET, AND WEBB STREET S^T THOMAS' HOSPITAL, LONDON;

AND W. CURRY JUN. & C^O 9 UPPER SACKVILLE STREET, DUBLIN.

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PART VII.—THE BRAIN,

FIRST PORTION.

COLOURED AFTER NATURE.

EDINBURGH:

PRINTED FOR DANIEL LIZARS, 61, PRINCES STREET, EDINBURGH;

S. HIGHLEY, 174, FLEET STREET, LONDON; AND

W. CURRY, JUN. & CO. 9, UPPER SACKVILLE STREET, DUBLIN.

1825.

EDINBURGH:
Printed by John Brewster,
11 Society.

TO

ROBERT WILLIAM HAY, ESQUIRE,

M. A. F. R. S. F. A. S.

AND COMMISSIONER FOR VICTUALLING HIS MAJESTY'S NAVY,

AS A TRIBUTE OF GRATITUDE,

FOR HIS DISINTERESTED FRIENDSHIP,

THIS PART IS RESPECTFULLY INSCRIBED,

BY HIS VERY OBEDIENT SERVANT,

THE AUTHOR.

PART VII.—THE BRAIN,

FIRST PORTION.

PREFACE.

THE Author has to plead the necessity there existed of colouring the Plates, as an apology for the delay which has occurred in presenting this Part to the Public. The Brain is an organ of such a nature, that it cannot be properly understood unless so delineated; and hence the most distinguished authors upon the subject, as Vicq D'Azyr and C. Bell, have published their works on the Brain in colours. The Author trusts, therefore, that the labour and time required to accomplish this object, will be considered sufficient apology.

In the views represented in the Plates, the Author has followed the common method adopted in the schools, although he confesses, that the mode of development pursued by Varolius, Vieussens, and Gall and Spurzheim, is more connected and natural,

as has lately been confirmed by the assiduous labours of Tiedemann. When the Author, therefore, has finished the description of the insulated portions, he will trace the nervous system in this natural order; but neither in the description of the insulated portions, nor in that of the naturally connected arrangement, will he particularize the various and multifarious points described by Vicq D'Azyr, Malacarne, Reil, and other celebrated anatomists, as he considers many of these bordering on frivolity. This the recent important researches of Tiedemann confirm, researches which, in the Author's humble opinion, tend to throw more light on the anatomy of this mysterious organ, than all the labours of his predecessors, however much the works of these great men are entitled to our respect and admiration. In the present description, the Author has been careful to particularize the discoveries of Tiedemann; and he will again advert to them, when he describes the Brain in its natural order.

In the course of the anatomical description, the Author had made several pathological and surgical observations; but he found these so intimately connected with the whole, that he has deemed it preferable to defer printing them, until the phy-

siological, pathological, and surgical observations are given in connexion. For example, when treating of compressed brain, he found this subject to embrace hydrocephalus and apoplexy; so that had he persevered, the whole of the pathological and surgical observations would have been given before the physiological.

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THE BRAIN.

THE nervous system is divided into the cerebrum letters A, the cerebellum letters B, and the spinal cord C, with the nerves issuing from these different portions, as represented in Plate I. The encephalic nerves, twelve in number, are not seen in this view, but are delineated in Plates VII. X. and XI. The spinal nerves consist of thirty pairs, but they are not numerically marked in this diagram, as that appeared unnecessary; they are subdivided, like the vertebræ, into 7 cervical, 12 dorsal, 5 lumbar, and 5 sacral pairs.

The cerebrum,* letters A, is that portion of the brain contained within the bones of the cranium, above or coronal to the tentorium, which is the extension of the dura mater between the cerebrum A, and the cerebellum B. The tentorium is partially seen in Plates VIII. and XI., marked *d*.

* Syn. The great brain: The brain proper: Le cerveau.

The cerebrum is divided into two hemispheres, marked A, A, in Plates I. and XIII.; and each hemisphere into three lobes, an anterior, marked a, a middle, *a*, and a posterior, a, as delineated in Plates II. and X. These lobular divisions are not apparent on the upper or coronal aspect of the cerebrum, but are tolerably distinct on the basis, as seen in Plate X; they are produced partly by the duplicatures of the dura mater, and partly by the bones, as represented in Plate XI. of Part VII., and in Plate IV. of Part I. The hemispheres are first observable in the fetus of seven weeks, in the state of two membranous pouches; at the end of three months, the anterior are discernible from the middle lobes, but the middle are not separated from the posterior lobes till the sixth month, and then only by a slight depression, for even in the adult they are not distinctly separated.

The dura mater* D, d, in Plate I., envelopes the cerebrum, the cerebellum, and the spinal cord; and accompanies the nerves, forming their chief support. This membrane, of a bluish milky colour, having a fibrous structure, is remarkably strong, and adheres to the bones of the cranium, forming their internal periosteum, where it surrounds the cerebrum and cerebellum, as described in Part I.: this surface is cellular, as represented in Plate III., while that which touches the brain is serous, as delineated in Plate XI.† The dura mater, after lining the frontal, parietal, and part of the temporal bones, and nearly the one half of the occipital bone, sends forth a transverse septum, which adheres to the internal trans-

* Syn. μηνιγξ σκληρη: Meninx dura: Hard membrane.

† The structure of the dura mater should be well considered by the practitioner in injuries and diseases of the head.

verse ridge of the occipital bone, marked *r*, in *Figs*. 3 and 4 of Plate IV. of Part I. and to the petrosal ridges, marked *v*, in *Figs*. 3 and 4. Plate IV. of Part I. This partition is denominated the tentorium cerebelli,* as it lies over the cerebellum, separating it partially from the cerebrum; a large oval foramen being found in its anterior or glabello-coronal aspect, to enable the crura cerebri to unite with the crura cerebelli. This tentorium is partially represented in Plates VIII. and XI., marked *d*, and in one of the plates of the organs of sense.

Where the tentorium commences at the transverse ridge of the occipital bone, a layer of dura mater is continued on the bone exterior or peripheral to the lateral sinuses, and also at the petrosal ridges; the dura mater, therefore, coming down from the coronal aspect, and up from the basilar aspect of the cranium, meets at these ridges to form the tentorium, but sends onwards an external lamina peripherad or exteriorly to the lateral and petrosal sinuses, so that these sinuses or veins separate the portions of the dura mater at the ridges. At the sutures, the dura mater sends fibrous productions to unite with the pericranium, for in the fetus, before ossification had begun, these membranes were in contact.

The dura mater sends a partition downwards in the longitudinal fissure between the two hemispheres of the cerebrum, named falx cerebri,† which descends nearly to the corpus callosum *w*, as delineated in Plate IV., marked 𝔳. This septum extends from the crista galli *b*, and the mesial line of the ethmoid bone, represented in Plate XI.,

* Tentorium cerebello super extensum: La tente du cervelet: Transverse middle septum.

† Syn. Vertical or falciform process: Faux cérébrale.

and in Part I. Plate IV., *Figs.* 3 and 4, along the mesial ridge of the frontal bone, and the junction of the parietal bones, where they form the sagittal suture, and the superior perpendicular ridge *q* of the occipital bone in Part I., Plate IV., *Figs.* 3 and 4. At this extremity it is much broader, and unites with the tentorium *d*.

The falx is formed in the same way as the tentorium, by the lateral portions of the dura mater uniting beneath or centrad to the mesial line of the os frontis, the sagittal suture, and the superior perpendicular ridge of the occipital bone; but leaving a triangular space for the superior longitudinal sinus, which is covered superiorly or coronad or peripherad by the outer lamina of the dura mater, so that the trephine may be applied over it without injury, if the operator proceeds with caution.

Besides these conspicuous productions of the dura mater, there are subordinate ones. A small prolongation extends from the inferior transverse ridge of the occipital bone, between the hemispheres of the cerebellum, as represented in Plate XI., marked δ, which is named falx cerebelli,* and is formed by the two surfaces of the dura mater, which line the cerebellic depressions of the occipital bone, uniting at the inferior perpendicular ridge of this bone. As there are generally no veins or sinuses here, the manner of its formation illustrates still more satisfactorily that of the falx cerebri and the tentorium cerebelli. Other still smaller prolongations extend along the transverse spinous processes of the sphenoid bone, which are marked B in Plate XI. The sella turcica of the sphenoid bone is observed to be surrounded by the dura mater in Plate XI., and marked C. This ex-

* Syn. Falx minor: Faux du cervelet.

tends from the anterior to the posterior clinoid processes, leaving loose lateral folds, and forming an acute circular edge, which surrounds the infundibulum *o*, in Plate XI. A small portion of the pituitary gland is observed uncovered within this circle. The dura mater also invests the floor of the sella turcica, and separates on each side to form the cavernous sinuses, as represented in one of the Plates descriptive of the organs of sense. This surface, which forms the cavernous sinuses, and invests the sella turcica, is cellular. The dura mater passes out of the various foramina in the basis of the cranium, either to unite with the periosteum of the bones externally, or to form the envelope of the nerves. At the foramen magnum of the occipital bone, it descends lining the spinal canal, as represented in Plate I., marked d.

The dura mater is observable in the fetus of seven weeks.

The membrane observed gliding over the surface of the convolutions of the cerebrum and cerebellum, and still more distinctly on the basis, is named tunica arachnoides.* This envelope is of a bluish milky colour, and so semi-transparent, that it cannot be represented easily on paper. If Plates I. II. III. X. and XII. were covered with mucilage of gum arabic, this would give, as far as possible, an idea of it.

After surrounding the surface of each hemisphere of the cerebrum, adhering to the pia mater on the convexity of the convolutions, the arachnoid membrane envelopes the veins marked with the digits 1 in Plate III., and becomes attached to the cerebral surface of the dura mater D, so as to form its cerebral lining, which is its serous surface. The arachnoid membrane also descends on each

* Meninx media: Membrana cellulosa: La lame externe de la méningine.

side between the falx cerebri ʊ, in Plate IV., and the mesial convolutions of the hemispheres, which it invests downwards to the corpus callosum *w*, where the two unite to form a continuous membrane; which afterwards may be traced posteriorly along the corpus callosum *w*, in Plate V., descending between it and the corpora quadrigemina, marked with the letters e, *e*, where investing the lower surface of the velum interpositum Halleri, marked i, *i*, in Plate VIII., it enters the third ventricle at the foramen commune posterius *a* to spread all over the cavities. Thus, after lining the parietes of the third ventricle 3 in *Fig.* 3 of Plate VII., it descends backwards along the iter a tertio ad quartum ventriculum* represented in Plate XIV., by a dotted line from 3 to 4, and forwards to the infundibulum *o* in *Fig.* 4 of Plate VII: it also ascends by the foramen commune anterius a in Plate VIII., to invest the fifth, marked 5 in *Fig.* 1 of Plate VII. and in Plate XIV., and onwards by the foramen Monroianum, marked M in Plate VI., to the lateral ventricles.

To return to the surface of the hemispheres,—we find the arachnoid membrane expanded over the convolutions, extending across the fissure of Sylvius, and descending between the cerebrum A and cerebellum B in Plate I. to invest the latter, then continuing its course to the basis of the brain, as observed in Plate X., running onwards to encircle the spinal cord C, as in Plate I., down to its termination, where it is reflected on the theca vertebralis d in Plate I. to form a *cul de sac*. In this course, it accompanies the spinal nerves for a short distance, and is then reflected to join that portion of itself which invests the dura

* In the fetus it descends between the columns of the spinal cord to the cauda equina.

mater, here termed theca vertebralis or spinal sheath, marked d in Plate I. In this canal it sends off between the anterior and posterior origins of the spinal nerves, simple duplicatures which extend from the pia mater to the dura mater, being attached to the latter by acute points intermediate to the emergence of the various spinal nerves, from the first to the cauda equina, where the tunica arachnoides becomes again plain and continuous. These denticulata, the whole being named ligamentum denticulatum or dentatum, presently resemble the angular folds, which accompany or envelope the spinal nerves. They adhere to the pia mater by delicate cellular membrane. They are represented in Plate XV. of a bluish colour, extending from the spinal cord c, to the dura mater d, between the different spinal nerves.

To return to that portion of the arachnoid membrane which adheres to the dura mater,—we find it continuous downwards to the margin of the falx ℨ in Plate IV., and all over the dura mater D, tentorium *d*, falx cerebelli δ, and theca vertebralis d in Plates I. and XI., forming its serous surface, and uniting with that which invests the brain and spinal cord, so as to form a perfect sac. Excepting by very minute injections, or when attacked with inflammation, no blood-vessels can be traced upon it. The tunica arachnoides begins to be observable between the fifth and sixth month of the fetus.

The pia mater* is that delicate tissue of blood-vessels, supported by soft cellular membranaceous substance, enveloping the whole surface of the cerebrum A, a, *a*, 𝔞, cerebellum B, spinal cord C, and nerves, as represented

* Syn. Pia meninx: Meninx tenuis: Meninx interior: Membrana vasculosa: La lame interne de la méningine; the soft membrane.

in Plates I. and II. This delicate membrane may be traced adhering to all the convolutions of the cerebrum and cerebellum, descending between their sulci or grooves; and also between the different lobes. On raising the posterior lobes of the cerebrum from the tentorium, we observe the broad vascular expanse of the velum of Haller or the choroid web, as in Plate VIII., marked i, *i*, and in *Fig.* 2 of Plate VII., advancing forwards superficially to the pineal gland H, the corpora quadrigemina e, *e*, and the thalami F, and running beneath the fornix K, on emerging from which in the lateral ventricles, it forms the choroid plexus* *i*, *i*, in *Fig.* 1 and 2 of Plate VII. and in Plate VI. From these plexuses, vessels shoot into the ventricles on the thalami F and the corpora striata G; the greater number of which are veins. This web or the choroid plexuses extend on each side around, backwards, downwards, and again forwards, or iniad, basilad, and glabellad, into the inferior cornua of the lateral ventricles, as seen in Plates VI. and VII. The arteries which supply this web are branches of the posterior artery of the cerebrum, marked *r* in Plate X. The veins concentrate to form the central vessel, marked i in *Fig.* 2 of Plates VII. and VIII., named after Galen. The pia mater formed by the minute distribution of the branches of the internal carotid and vertebral arteries, can be raised from the surface of the convolutions; and in doing so, a multiplicity of small vessels are dragged out of the substance of the brain.

The pia mater, after enveloping the cerebrum and cerebellum, descends on the tuber annulare E in Plate X.,

* Syn. Les plexus choroides superieurs. The choroid plexuses are subject to encysted serous tumours resembling hydatids, and to small tubercles, like glands.

where it begins to become thicker, and continues to encircle the spinal cord c in Plate I., being considerably stronger than where it invests the cerebrum and cerebellum: it continues to descend to the cauda equina, investing the nerves in its course, and is lost on them, like their envelope of the dura mater.

The pia mater is formed in the fetus so early as the sixth week.

There are various methods adopted in dissecting the brain; but that which is generally ascribed to Vesalius, being the one most frequently followed, I have preferred, although the method described by Varolius and Vieussens is the more connected. When the different parts have been simply demonstrated, I shall describe this organ in a connected order; for the brain ought to be examined in a variety of ways.

On the mesial aspect of the surface of each hemisphere, close to the longitudinal sinus, and in the sinus itself, are observed small glandular-looking bodies about the size of a pin's head, named glandulæ Pacchioni. These are most numerous towards the posterior or inial aspect of the mesial surface of the hemisphere. A few of them are represented within the sinus, which is marked *x* in Plate III.

On separating the hemispheres A, A, Plates I. and XII., of the cerebrum, at the fissure in which the falx cerebri,* Plate IV. descends, we arrive at an oblong white surface, consisting of an arrangement of transverse medullary fibres, termed corpus callosum,* marked with the letters *w*, forming the floor of this fissure.

* Syn. σωμα τιλλοειδὲς: Fornix vera: Corpus laeve: Commissura magna vel maxima cerebri: Middle or central band: Mesolobe.

This unites the medullary matter E of the one hemisphere with that of the other, as represented in Plate V. In the fetus, this commissure begins anteriorly to the anterior crura k, k, of the fornix, as seen in Plate VII., *Figs.* 2 and 3, and in Plates VIII. IX., and gradually proceeds backwards with the growth of the hemispheres. This is still better illustrated in Plate XIV., where the connexion of the medullary matter is represented. The corpus callosum is not completed till the sixth month. In Plates IV. and VI. the fibrous or streaked appearance is more correctly delineated than in Plate V., as the weight of the hemispheres from which this latter drawing was taken, had in some degree injured the corpus callosum. In the latter or Plate V. the corpus callosum is observed to be somewhat broader posteriorly or iniad, than anteriorly or glabellad. In Plate VI. there are observed three delicate lines running longitudinally along the corpus callosum, the central one of which is named raphe.* Where these lines extend, the corpus callosum is a little elevated. The two lateral lines appear to be formed by the arteries of the corpus callosum, marked *v*, *v*. When we trace the corpus callosum backwards or iniad, we find it joining or uniting with the expanse of the fornix K, as represented in Plate XIV.

In Plate IV., a section of the right hemisphere has been made parallel to the corpus callosum *w*, which brings into view the two substances which compose the general cerebral mass; the white or orange-white matter E is named medullary,* and appears to be the efficient constituent of this wonderful mass; the greyish, cineritious, or

* Syn. White nervous matter.

reddish, or greyish-brown, or wood-brown matter, which every where surrounds this white mass, is termed cortical.* On examining the surface of the hemispheres A, A, of the cerebrum in Plates I. II. III. and IV., we remark a multiplicity of elevations and furrows, named the convolutions, which are better understood in the sections of Plates IV. V. and VI. These are very late in being developed in the fetus; not until the seventh month.

On removing the falx cerebri ꝟ, and the opposite hemisphere parallel with the corpus callosum *w*, we bring into view the centrum ovale of Vieussens, marked E, E, in Plate V. Another oval centre is represented by Vicq D'Azyr, by making a transverse or horizontal section a little above or coronal to this, named centrum ovale latéral ou petit centre ovale. Vicq D'Azyr thus makes an oval centre out of each hemisphere, while Vieussens makes only one. These are simply the condensation of the white medullary matter in the hemispheres.

When a perpendicular incision is made along the lateral margins of the corpus callosum *w*, we come to large cavities, named the lateral ventricles,† which, when their roof is removed, as in Plate VI., exhibit three terminations, denominated cornua, and several bodies. A indicates the anterior cornu;‡ P, the posterior cornu;§ and I, the inferior cornu of each cavity.

The objects seen in each lateral ventricle are the corpus striatum G, the thalamus F, the tænia semicircularis *t* sepa-

* Syn. Brown nervous matter: The extreme vascularity both of the medullary and cortical substances should be carefully considered by the practitioner.

† Syn. Ventriculus tricornis: grand cavité du cerveau.

‡ Syn. Anterior sinus of superior ventricle.

§ Syn. Cavité-digitale: Ancbyroide.

rating these, the plexus choroides I, and the fornix K; these two cavities being apparently separated by the septum lucidum L. The corpus striatum G* situated in the middle and anterior part of the ventricle, is of an oblong pyriform shape, and of a reddish-brown colour, extends onwards into the anterior cornu A, and is bounded posteriorly or iniad by the tænia semicircularis *t*, and covered by the tunica arachnoides. This body, we shall afterwards find, has acquired its name from the crura cerebri, being radiated through its cineritious substance. These striated bodies begin to be formed about the third month of the fetal life.

The tænia semicircularis † is a bluish line extending between the corpus striatum G and the thalamus F, and is marked *t* in Plate VI. In the subject from which the drawings of this part were taken, it was a bold distinct vein; but in many, this vein is covered by a layer of medullary matter, so as almost to obscure, and give it only a bluish appearance. This vein can be traced to join the choroid plexus at its anterior aspect.

Tiedemann found in the seventh month of the fetus merely a groove between the corpus striatum and the thalamus; and not until the ninth month was this groove filled by vessels and medullary matter.

The choroid plexus has already been described, and the thalamus cannot be understood in this stage of the dis-

* Syn. Le corps cannelé: Grand ganglion cérébral superieur: Partie interne du grand ganglion cérébral superieur: Processus anterior medullæ oblongatæ: Processus lentiformis: Ganglion anticum.

† Syn. Geminum centrum semicirculare: Stria cornea sive semicircularis: Frenulum novum Tarini: Limbus posterior corporis striati Willisii: Tænia fibrosa corporis striati: Tænia striata: Bandelette semicirculaire: La lame cornée: La lame grise ou cendrée.

section; so that we must first examine the septum lucidum L.* This delicate partition extends from the corpus callosum *w* to the fornix K, and is found to consist of two medullary laminæ, which form a cavity, named the fifth ventricle,† as represented in *Fig.* 1 of Plate VII., and in Plate XIV. This cavity, marked 5, is found to communicate with the others at the foramen Monroianum M in Plate VI., or at the foramen commune anterius a, Plate VIII; its canal of communication, therefore, descends between the anterior crura k, k, of the fornix K in *Figs.* 2 and 3 of Plate VII., also in Plates VIII. and IX. In the fetus, the two laminæ of the septum lucidum are quite apart, and are not observed until the fifth month to extend from the two anterior pillars of the fornix (which are also separate, and hence a free communication presents itself between the third and fifth ventricle) to the corpus callosum.

The fornix‡ K in Plate VI., and in *Fig.* 1 of Plate VII., situated in the middle and posterior parts of the lateral ventricles, is a broad medullary expanse, which begins at the corpora albicantia *s*, *s*, of Plates X. and XIII., ascends by its two anterior crura *k*, *k*, to the floor of the lateral ventricles, where they unite and form a broad expanse, which runs backwards or iniad, resting on the thalami F, F, and continuing to expand as it extends backwards and mesiad into the posterior cornua P, P, to form the hippocampi minores§ *k*, *k*; and as it descends downwards and

* Syn. Septum medium cerebri: Cloison des ventricules: Cloison transparente: Septum pellucidum: Speculum lucidum.

† Ventriculum septi medii.

‡ Syn. La voûte à trois piliers: La masse commune de communication.

§ Syn. Unguis: Caveæ posterioris ventriculi lateralis: L'éperon: L'ergot: Petit hypocampe: Eminence digitale: Eminence unciforme.

forwards, or basilad and glabellad, resting on the crura cerebri, into the inferior cornu I, to form the hippocampi majores* 𝔨, 𝔨: one of these latter white eminences is observed in Plate IX. to run a long way onwards, its termination being named pes hippocampi, and its free margin, which overlaps the plexus choroides *i*, or is overlapped by it, the corpus fimbriatum.† This hippocampus major is considered the posterior crus of the fornix. The posterior part of the fornix forms a continuous substance with the corpus callosum, as may be easily understood from Plate V. On elevating the posterior part of the corpus callosum 𝔴, we raise at the same time the fornix, bringing into view its inferior or basilar surface connected with the choroid web; the impression which this web forms on the basilar surface of the fornix is termed lyra or psalterium; see *Fig*. 2, Plate VII., K. In this figure there is no appearance of a lyre, and it requires a considerable stretch of the imagination to perceive the resemblance. In the fetus of four months the fornix begins by two slender cords at a bulky shapeless mass (the corpora albicantia, in the base of the brain, marked *s*, *s*, in Plate X.), which ascend and unite under or basilad to the corpus callosum, then separate and extend backwards or iniad over the thalami, descending to the base of the posterior lobes of the hemispheres.

The choroid plexuses have been described in page 8.

The thalami nervorum opticorum‡ F, F, in Plate VI.,

* Syn. Cornu ammonis: Les grands hypocampes.

† Syn. Corps frangé: Corps bordé: Bandelette de l'hypocampe: Tænia hypocampi: Borde interne, concave, dentelé ou godronné.

‡ Syn. Colliculi nervorum opticorum: Optic chambers: Les couches optiques: Les grands ganglions cérébral inferieurs: Juga crurum medullæ oblongatæ: Ganglion posticum: Corpus striatum posterius.

in *Figs.* 1, 2, 3, and 4, of Plate VII., and in Plates VIII. IX. and XIV., are situated beneath or basilad to the fornix K, and choroid web i, *i*, forming the sides of the third ventricle 3, and partially seen in the lateral ventricles. They are of an oblong bulbous shape, narrower anteriorly than posteriorly, applied to each other by their mesial sides, bounded laterally by the tænia semicircularis *t*, and posteriorly or iniad by the corpora quadrigemina e, *e*; their mesial sides being connected by a cineritious band, named the commissura mollis, which is marked m, in *Fig.* 3 of Plate VII. This commissure is not found in the fetus till the ninth month. In this representation the thalami are separated a little to expose this commissure, while in Plates VIII. and IX. they touch each other, being drawn in their natural state in these diagrams. Three small elevations on the surface of the thalami are taken notice of by authors: the first, situated anteriorly, and marked f in *Fig.* 3 of Plate VII., and in Plates VIII. and IX., is named the anterior tubercle; the second situated posteriorly, and near the pineal gland H, is termed the inner or internal tubercle, or corpus geniculatum internum, and is marked *f*; and the third, situated exteriorly near the bold termination of the optic nerve, is styled outer or external tubercle, or corpus geniculatum externum: this latter has not been displayed, considering it unnecessary to give a figure for this individual point. The corpora geniculata will be described hereafter under the optic nerve. They are observed about the sixth month of the fetus. The thalami consist of medullary matter externally, and cineritious and medullary internally. They are visible in the fetus of seven weeks.

In Plates VIII. and IX., the foramen commune ante-

rius, or vulva, a, and the foramen commune posterius, or anus *a*, are represented; which form the sources of communication between the lateral and third ventricles. When the thalami, therefore, are held apart, we expose a cavity denominated the third ventricle, * marked 3, in *Fig.* 3 of Plate VII., which is formed superiorly and laterally by these thalami F, F, together with the commissura mollis, and inferiorly or basilad by the crura cerebri C, and tuber annulare E, as seen in Plate XIV. The iter ad infundibulum, marked I in *Fig.* 4., is observed leading downwards or basilad from the anterior or glabellar extremity of this third ventricle, the infundibulum † itself being marked *i*. This is a delicate tube, which leads to the pituitary gland‡ P, and which consists of cineritious matter, and is of a funnel-like shape, the base being turned to the third ventricle. The pituitary gland is a small round body situated in the sella turcica of the sphenoid bone, partially covered by the dura mater, and composed of the cineritious and medullary substances of the brain; the posterior or inial portion being medullary, and the anterior or glabellar being cineritious. The infundibulum descends only a short way into its substance. In the fetus of four months this body is quite hollow. The iter§ à tertio ad quartum ventriculum, indicated by a dotted line in *Fig.* 4 of Plate VII., and in Plate XIV., is observed leading backwards or iniad from the third ventricle. This canal is also partly

* Syn. Ventricule moyen du cerveau : L'intervalle entre les grands ganglions cérébraux inferieurs.

† Syn. La Tige pituitaire.

‡ Syn. Hypophysis sive glandula pituitosa.

§ Syn. Aqueductus Sylvii.

seen in this *Fig.* 4 of Plate VII., but this I shall describe afterwards, having still to mention how the two lateral ventricles communicate. In Plate VI. is seen a pretty large foramen, marked M, extending across to the opposite cavity, beneath or basilad to the anterior crura k, k, of the fornix K, and immediately anterior or glabellar to the apparent anterior extremities of the choroid plexuses *i*, *i*; and in *Fig.* 2 of Plate VII., where the fornix K has been cut across at this communication, and reflected back, this communication is further illustrated: it is termed the foramen Monroianum. When the thalami are held apart, and when we look anteriorly in the third ventricle, we observe a small white cord extending across, apparently between the anterior crura of the fornix, to which, however, it is anterior or glabellar: this is named the anterior commissure,* and unites the medullary matter of the one corpus striatum to that of the other. It is marked *c* in *Fig.* 3 of Plate VII., and in Plates IX. and XIV.; also in *Fig.* 4 of Plate VII. This anterior commissure is perceivable at the third month of the fetus. On looking backwards or iniad in the third ventricle, we perceive another white cord, marked *p* in *Figs.* 3 and 4 of Plate VII., and in Plates VIII. IX. and XIV., which is named the posterior commissure; this unites the medullary matter of the thalami, and is observed in the fetus towards the end of the third month. A small ovate or heart-shaped body, resembling in shape a pine-apple, and hence named the pineal gland,† seen in *Fig.* 3 of Plate VII., and in Plates VIII. IX. and XIV., marked H, is observed at-

* Syn. Commissura nævii æmula.

† Syn. Corps pineal: Conarium: Corpus turbinatum.

tached posteriorly to the mesial sides of the thalami, by two slender crura or peduncles, marked *h*. Where the peduncles run on the thalami, they are named by some authors the tracts of the pineal gland. This object consists chiefly of cineritious matter, and in the adult there is generally found a small quantity of sandy particles, named acervulus cerebri, which are not found in the fetus, and the gland itself is not observable till the fourth month. The peduncles consist of medullary matter.

The corpora quadrigemina are these four small round bodies, situated posteriorly and inferiorly or iniad and basilad to the pineal gland H; they are represented in *Figs.* 3 and 4 in Plate VII., and in Plates VIII. IX. and XIV., marked e, *e*. The two superior, e, e, are termed nates,* and the two inferior testes:† the superior or nates are somewhat larger, rounder or fuller than the inferior or testes, and are of a redder colour, consisting more of the cineritious substance. These four eminences form part of the roof of the *iter a tertio* (3) *ad quartum* (4) *ventriculum*, as represented in Plate XIV. by a dotted line. The corpora quadrigemina are observed in the fetus of two months in the shape of two membranous laminæ, separated by a longitudinal fissure, which become joined at the end of the third month, and then appear rounder and firmer.

* Syn. Corpora Bigemina superiora: Tubercula quadrigemina anteriora: Tubercules quadrijumeaux superieures ou anterieures: Tubercula anteriora: Protuberantiæ orbiculares: Protuberantiæ natiformes.

† Syn. Corpora Bigemina inferiora: Tubercula quadrigemina posteriora: Tubercules quadrijumeaux inferieures ou posterieures: Tubercula posteriora: Protuberantiæ minores.

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OF

THE LETTERS OF REFERENCE

IN

PART VII.

THE BRAIN, FIRST PORTION.

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B, Hemispheres of the cerebellum
C, Spinal cord
D, Dura mater
d, Theca vertebralis

PLATE II.

A, Left hemisphere of the cerebrum
B, Left hemisphere of the cerebellum
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X, Cervical vertebræ
Y, Margin of the cranium
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d, Theca vertebralis
a, Middle lobe of the cerebrum
x, Superior longitudinal sinus
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a̅, Posterior lobe of the cerebrum

PLATE II. (*Continued.*)

9, Lower cervical nerves, which form axillary plexus
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PLATE IV.

A, Left hemisphere of the cerebrum
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Y, Margin of the cranium

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y, Middle artery of the cerebrum

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PLATE V.

B, Hemispheres of cerebellum
C, Spinal cord
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o, Anterior arteries of cerebellum
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E, Medullary matter of hemisphere
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G, Corpus striatum
I, Inferior cornu of lateral ventricle
K, Fornix
L, Septum lucidum
M, Foramen Monroianum

P, Posterior cornu of lateral ventricle

i, Choroid plexus
k, Hippocampus minor
r, Posterior artery of the cerebrum
t, Tænia semicircularis
v, Artery of corpus callosum
y, Middle artery of the cerebrum

ꝁ, Hippocampus major

PLATE VII. *Fig.* 1.

F, Thalamus nervi optici
G, Corpus striatum
K, Fornix
L, Septum lucidum

i, Choroid plexus
t, Tænia semicircularis
w, Corpus callosum

5, Fifth ventricle

PLATE VII. *Fig.* 2.

F, Thalamus nervi optici
G, Corpus striatum
K, Fornix

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i, Vena magna Galeni
k, Anterior crus of fornix

i, Choroid plexus
i, i, *i*, Velum interpositum Halleri
t, Tænia semicircularis
w, Commencement of corpus callosum

Fig. 3.

F, Thalamus nervi optici
G, Corpus striatum
H, Pineal gland

a, Foramen commune anterius
e, Natis
f, Anterior tubercle of thalamus
k, Anterior crus of fornix
m, Commissura mollis

c, Anterior commissure
e, Testis
f, Corpus geniculatum internum
h, Peduncles of pineal gland
p, Posterior commissure
t, Tænia semicircularis
w, Beginning of corpus callosum

Fig. 4.

E, Tuber annulare
F, Thalamus nervi optici
H, Pineal gland
I, Iter ad infundibulum
P, Pituitary gland

e, Natis

c, Anterior commissure
e, Testis
h, Peduncles of pineal gland
i, Infundibulum
p, Posterior commissure
r, Posterior artery of the cerebrum

3, Third ventricle
19, Internal carotid artery

Fig. 5.

Section of the medulla oblongata

Fig. 6.

F, Corpus olivare

G, Corpus pyramidale

Fig. 7.

E, Tuber annulare
F, Thalamus nervi optici
O, Ophthalmic artery
R, Vertebral artery

q, Basilar artery

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11, Accessory nerve of Willis
12, Lingual nerve
19, Internal carotid artery
21, First cervical nerve
22, Second cervical nerve
23, Third cervical nerve
24, Fourth cervical nerve